

MR. ROSS H. ARNETT'S "REVISION OF THE
NEARCTIC SILPHINI AND NICROPHORINI"

BY MELVILLE H. HATCH

Mr. Ross H. Arnett, Jr., of Cornell University published in the March 1944 number of this JOURNAL a paper entitled, "A Revision of the Nearctic Silphini and Nicrophorini Based upon the Female Genitalia (Coleoptera, Silphidæ)."¹ In the course of his study, Mr. Arnett has made some noteworthy discoveries. He has, for instance, found morphological bases for the recognition of *Nicrophorus nigritus* Mann. and *N. hecate* Bland. as distinct species. There has probably been no recent student of the group who has not wished that the first of these, at any rate, might be so regarded. Specimens stand out absolutely without suggestion of intergradation in the collection, and both forms, except for traditional conservativeness about recognizing species on exclusively color characters, would long ago have been regarded as of full specific rank. Portevin,² in fact, did so recognize *N. hecate* Bland., but I failed to follow him because of the above mentioned prejudice against separating species on color characters, a feeling that Mr. Arnett continues to share.

Furthermore, Mr. Arnett has called attention to Latreille's³ 1810 selection of generitypes for *Silpha* and *Nicrophorus*. Latreille's citation of *vespillo* L. as the type of *Nicrophorus* is apparently unambiguous, antedating Thompson's⁴ designation of *germanicus* L. This requires that *Nicrophorus* s. str. be substituted for the subgeneric name *Necropter* Semenov-Tian-Shanskij,⁵ type *Nicrophorus investigator* Zett., and that a new name—I propose *Neonicrophorus* nov.—be substituted for Semenov-Tian-Shanskij's *Nicrophorus* s. str.,⁶ type *Silpha germanica* L.

¹ JOUR. N. Y. ENT. SOC., LII, 1944, p. 1-25, pl. I-IV.

² Bull. Mus. Hist. Nat., Paris, 1924, p. 85; Encycl. Ent., VI, 1926, p. 213, Fig. 176.

³ Latreille, Considérations Générales sur l'ordre Naturel des Animaux, Paris, 1810, p. 426.

⁴ Skandinaviens Coleoptera I, 1859, p. 55.

⁵ Trav. de l'Inst. Zool. de l'Acad. de Sci. de l'U.S.S.R., I, 1932, p. 154.

⁶ L.c., p. 153.

The case of the type of *Silpha* is not so simple. Latreille cites *littoralis*, but adds "ejusd. *obscura*." According to opinion 136 of the International Commission on Zoological Nomenclature,⁷ "Opinion 11 of the International Commission, which directs that the 'table des genres avec l'indication de l'espèce qui leur sert de type,' which is attached to Latreille's *Considérations générales* of 1810, should be accepted as constituting a designation, under Article 30 of the Code, of the types of the genera in question, applies only to those genera there cited by Latreille, in which he placed one only of the species included in the genus by the original author thereof."

The generitypes of *Silpha* L. and *Necrodes* Leach were set by Leach in 1815.⁸ *Necrodes* was established to include *Silpha littoralis* L. and a supposedly newly described species, *N. curtisi* Leach, apparently a synonym of *littoralis*. For *Silpha* s. str. a single species, *S. obscura* L., was cited. This species, therefore, becomes the type of the genus, and was so indicated by me in 1928.⁹ Thomson,¹⁰ indicates *S. carinata* "Illig." as the generitype, a species that was not even included in Linnaeus' original description of the genus! The point is of little practical importance at present, however, since both *obscura* and *carinata* belong to the same restricted section of the group.

The status of Mr. Arnett's *Nicrophorus* "*melsheimeri* Kby." is not clear. He includes it among the species with a strongly cordate pronotum without other information than that which pertains to the female genitalia and that the metepimeron is glabrous. LeConte's¹¹ placing of the type among those species with a transversely oval pronotum has never been challenged previous to the appearance of Arnett's paper.

It is, however, when one turns from the analytic to the synthetic

⁷ Opinions Rendered by the International Commission on Zoological Nomenclature. Edited by Francis Hemming. London. Vol. 2, 1939, p. 15.

⁸ Article on Entomology in Edinburgh Encyclopedia, 1815, Vol. IX, pp. 57-172, genus LXXXVI (Vol. VIII, pp. 677-678 of pp. 646-758 in the American Edition of 1832).

⁹ Hatch, Col. Cat., 95, 1928, p. 78.

¹⁰ Skandinaviens Coleoptera I, 1859, p. 56.

¹¹ Ann. Mag. Nat. Hist., (4), VI, 1870, p. 398; Proc. Acad. Nat. Sci. Phil., 1873, p. 326.

aspects of Mr. Arnett's work that questions begin to arise. Mr. Arnett assumes (p. 1) that "the genitalia are naturally more constant within a species than other parts and they give the taxonomist a better concept of a species, and its subspecific forms and categories," and concludes (p. 15) that "the female genitalia of Silphini and Nicrophorini present characters which serve to separate the species of the groups." Because the female genitalia present characters that serve to separate certain species it does not follow that all the species are so separated. Nor does it follow that this one set of structures is the all-sufficient criterion for accepting or rejecting all the other systematic categories that it may be convenient to recognize. If present-day systematics has any lesson to teach at all it is that the characters it employs must be drawn from every aspect of the body, of the life history, and of the physiology. Not genitalia, not larvæ, not wing venation, but the organism as a whole must be considered in devising a classification. Each special study has its own contribution to make, but only a synthesis of the whole can hope to give an adequate conclusion.¹²

For over a century continental coleopterists have labored with the classification of the larger Silphidæ, the work culminating in Portevin's great monograph,¹³ dividing the group into three tribes, twenty-six genera, and three subgenera. My studies served as little more than footnotes to these European ones. I did reduce Portevin's twenty genera of Silphini to subgenera, but this did not affect the integrity or importance of the groups themselves. No one, I least of all, knows the difference between a genus and subgenus, and my action was predicated on the general assumption of the desirability of keeping down the number of genera and of making use of the subgenus as a category intermediate between the genus and the species. In *Nicrophorus* I did attempt to divide Portevin's nearly unorganized assemblage

¹² The truth of this was borne in on me several years ago when, in an unpublished study, I tabulated side by side the innovations in the general classification of beetles that various authors have proposed on the basis of the study of particular parts. The result was that most of the suggested changes were nullified and cancelled out!

¹³ Les Grands Necrophages du Globe. Ency. Ent., VI, 1926, 270, pp., 201 figs.

of about 60 species into 7 phyletic groups. The study of the Nicrophorini was continued in 1932 by the Russian coleopterist, A. P. Semenov-Tian-Shanskij, who increased my two genera, one subgenus and 7 phyletic groups to 5 genera and 8 subgenera.¹⁴

Mr. Arnett reduces some fifteen of Portevin's groups to four, largely because he does not find in the female genitalia characters to correspond with the traditional ones. On the same basis he tells us, (p. 16) "*Nicrophorus* offers no distinct species groups." What reasons are there for supposing that all evolution leaves its imprint on the female genitalia? If the female genitalia offer no distinct clue to species groups, that can only mean that the field is left free for the utilization of characters derived from other parts of the body. It must be shown that these other characters severally are the result of parallel or convergent evolution before they can be disqualified. This Mr. Arnett's study fails to provide.

But the most extreme of Mr. Arnett's innovations are still to be considered. *Silpha aenescens* Csy.¹⁵ is made a synonym of *ramosa* Say (p. 3) without a word of discussion, and *Necrodes* (*Protonecrodes*) *surinamensis* Fab. is made a "form" of *Necrodes* (s. str.) *littoralis* L. (p. 13). *S. aenescens* differs in the secondary sexual characters of the elytra apex of the female¹⁶ and of the tarsi of the male, in the form of the male genitalia, and in color, though this is perhaps the least reliable of its characters. It is in reality a remarkably distinct species, in which the males

¹⁴ Trav. de l'Inst. Zool. de l'Acad. de Sci. de l'U.S.S.R., I, 1932, p. 149-160. Most of the Semenov-Tian-Shanskij's groups were made at the expense of single or small groups of species belonging to the more generalized groups of my classification and segregated out by individual specialized features which I had either deemphasized or overlooked in my treatment. The great majority (43) of the species are left in the subgenus *Nicrophorus* s. str. (*Necropter* Sem.) which may still be subdivided along the general lines of my paper. Of the certainly established Neartic species, only *americanus* Fab., placed in the subg. *Eunecrophorus* Sem. on the basis of its bicolored pronotum, and *pustulatus* *Hersch.*, placed in the subg. *Stictonecropter* Sem. on the basis of its elytral margin extending nearly to the humerus, are other than *Nicrophorus* s. str.

¹⁵ Bull. Cal. Acad. Sci., II, 1886, p. 171-173. Both Portevin and I are in error in our previous citations of this species.

¹⁶ Mr. Arnett probably rejects such a character in the light of his sixth conclusion (p. 16): "The form and sculpturing of the elytra of Silphini do not show relationships between the species!"

can scarcely be distinguished from the females, except by dissection.

The case of *Necrodes* (*Protonecrodes*) *surinamensis* Fab., is even more striking. Regarded as generically distinct from *N. littoralis* L. by Portevin, it is reduced to a "form" of that species by Mr. Arnett under the name "*Silpha littoralis*," on the basis of occasional immaculate specimens and no differences in the genitalia. Mr. Arnett should give careful consideration to Portevin's diagnoses of the categories involved, as given in his monograph. Being so little concerned with elytra, he might well be quite unimpressed by the female secondary sexual characters of the elytral apex that Portevin cites or the striking difference in the structure of the elytral costæ. Perhaps the secondary sexual characters of the legs of the male will seem more important. I do not care to argue whether *surinamensis* is generically or subgenerically distinct from *littoralis*, but that it is at least a distinct species I regard as probable. *Surinamensis* is confined to America east of the Rocky Mountains. *Littoralis* is European. Mr. Arnett should investigate the three other related and geographically intermediate Asiatic "species" before being willing to conclude too much.

Nothing that has been said above about elytra or secondary sexual characters means that I regard these as necessarily primary taxonomic characters. Perhaps it is, as Boving states,¹⁷ "that primary sexual characters . . . offer the more solid bases for a natural and tenable classification." But that does not imply that everything else is to be disregarded, especially where the genitalia are phylogenetically conservative.

Furthermore, nothing that has been said deprecates the central portion of Mr. Arnett's work, his study of the female genitalia. As a result of this he has shown that in certain cases species may be recognized where subspecies have been recognized before. He suggests that certain lines of cleavage in the Silphini and Necrodini are perhaps not entirely as they should be. To this extent his study is a welcome contribution to the study of the larger Silphidæ, but the suggestion that it provides a vantage point for the "revision" of the entire group would seem to be open to question.

¹⁷ Mem. Ent. Soc. Wash., 2, 1942, p. 53.